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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
|-----------------|-------------|----------------------|---------------------|------------------|

10/799,548

03/11/2004

Kedar Shirali

MP0432/13361-085001

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26200 7590 09/04/2007
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EXAMINER

JAIN, RAJ K

ART UNIT

PAPER NUMBER

2616

MAIL DATE

DELIVERY MODE

09/04/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/799,548

Applicant(s)

SHIRALI ET AL.

Examiner

Raj K. Jain

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-87 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-87 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4, 8-11, 16-19, 22-25, 28-31, 33-36, 39-42, 45-48, 52-55, 60-63, 67-70, 74-77 and 81-84 are rejected under 35 U.S.C. 102(b) as being anticipated by Wang et al (US 2002/0003774 A1).

Regarding claims 1, 2, 8, 9, 16, 17, 22, 23, 28, 29, 33, 34, 39, 40, 45, 46, 52, 53, 60, 61, 67, 68, 74, 75, 81 and 82 Wang discloses an OFDM system (see abstract) comprising:

transmitting a pilot symbol structure including a first pilot symbol including pilot information on a first plurality of alternate tones (see para 3, 4, 6 and 7, channel estimation in the receiving device is usually performed on the basis of pilot symbols transmitted from the transmitting device and therefore carrying appropriate pilot information).

a second pilot symbol including pilot information on a second plurality of alternate tones, wherein the tones in the second plurality of alternate tones are mirror tones of the tones in the first plurality of alternate tones (see Figs 3 and 4, and para 31, second pilot symbols as shown in Fig 4 ie. 42, 43...53 are transmitted in the same subcarrier

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frequency as the first pilot symbols shown in Fig. 3 20, 21....28 and therefore are mirror frequencies to each other.).

Regarding claims 3, 4, 10, 11, 18, 19, 24, 25, 30, 3135, 36, 41, 42, 47, 48, 54, 55, 62, 63, 69, 70, 76, 77, 83, and 84 Wang discloses wherein the pilot symbol structure further includes a third pilot symbol, the third pilot symbol being identical to the first pilot symbol (see Figs 3 and 4, where pilot symbol 22 being is same as first transmitted say symbol 21, furthermore the symbol 22 is between say first symbol 21 and next symbol in line (not labeled)).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 5-7, 13-15, 20, 21, 26, 27, 32, 37, 38, 43, 44, 49-51, 57-59, 54-66, 72, 73, 78-80, 86 and 87 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang et al (US 2002/0003774 A1) in view of Shoemake et al (US 2003/0231715 A1).

Wang fails to disclose an OFDM system transmission within an MIMO, MISO, SISO or 802.11n system.

Shoemake discloses an OFDM system transmission within an MIMO, MISO, SISO or 802.11n system (see paras 8, 26, 28 and 47). The use of multi-channel modulation schemes allows for optimizing wireless communications in concert with

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wireline networks that employ different tones for channel characterization. Shoemake further discloses channel estimation on valid data to be transmitted otherwise data may not be transmitted for non valid tones (see para 41). Thus it would have been obvious at the time the invention was made to incorporate the teachings of Shoemake within Wang so as to improve network performance by providing an efficient and seamless connection for different systems and/or standards. null

Claims 56, 71 and 85 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang et al (US 2002/0003774 A1) in view Kim (US 2002/0126618 A1).

Wang fails to disclose frequency offset calculations for different pilot symbol intervals.

Kim discloses frequency offset calculations for different pilot symbol intervals (abstract, para 0018). Frequency offset variations provides for coarse and fine synchronization of frequencies. Thus it would have been obvious at the time the invention was made to incorporate the teachings of Kim within Wang and thus improving the synchronization of frequencies.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Raj K. Jain whose telephone number is 571-272-3145. The examiner can normally be reached on M-F 8-5.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chi Pham can be reached on 571-272-3179. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Raj K. Jain

/Raj K. Jain/

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August 22, 2007